

Health Science Education
Biomedical Applications
Course Code #5513

1 Credit

School Year _____

Term: _____ **Fall** _____ **Spring**

Rate each student on the following

- 3 – Mastered (Can work independently with no supervision)
- 2 – Require supervision (Can perform with limited supervision)
- 1 – Not mastered (Requires instructions and close supervision)
- N – No exposure (No experience or knowledge in this area)

Student: _____ Grade _____
Teacher: _____ School _____
Number of Competencies in Course: 34
Number of Competencies Mastered: _____
Percent of Competencies Mastered: _____

Standard 1.0 The student will know and apply the academic subject matter required for entrance into the field of biomedical research.

*One of these columns must be checked

Learning Expectations		Check the appropriate Mastery or Non-Mastery column*				Rating (Circle one)				Mastery	Non-Mastery
1.1	Evaluate the history of biomedical research in respect to time, culture, religion, and regions.					3	2	1	N		
1.2	Use biomedical terminology including root words, prefixes, suffixes, and abbreviations.					3	2	1	N		
1.3	Develop the foundation in scientific knowledge and skills necessary for a successful career in biomedical research.					3	2	1	N		
1.4	See the integration of various science disciplines with biomedical research.					3	2	1	N		
1.5	Discuss the benefits and risk of biomedical research.					3	2	1	N		
1.6	Use knowledge gained to demonstrate proficiency in reading and interpreting biomedical research.					3	2	1	N		

Standard 2.0 The students will demonstrate proficiency in understanding basic skills and safety in the laboratory.

*One of these columns must be checked

Learning Expectations		Check the appropriate Mastery or Non-Mastery column*				Rating (Circle one)				Mastery	Non-Mastery
2.1	Read, interpret, verbalize, and apply policies and procedures appropriate to the biomedical research setting.					3	2	1	N		
2.2	Demonstrate the safe and appropriate use of equipment and supplies; utilize proper communication, critical thinking and problem solving techniques.					3	2	1	N		
2.3	Demonstrate proficiency with basic microbiology laboratory skills.					3	2	1	N		

Standard 3.0 The students will demonstrate proficiency in understanding and manipulating DNA.

*One of these columns must be checked

Learning Expectations		Check the appropriate Mastery or Non-Mastery column*				Rating (Circle one)				Mastery	Non-Mastery
3.1	Describe the two different functions of DNA.					3	2	1	N		
3.2	Illustrate how the structure of DNA relates to these functions.					3	2	1	N		
3.3	Outline the stages involved in transcription and translation.					3	2	1	N		
3.4	Describe the role of a plasmid and restriction enzymes in genetic engineering.					3	2	1	N		
3.5	Describe how recombinant DNA is constructed and analyzed.					3	2	1	N		
3.6	Describe how polymerase chain reaction works and is used in biomedical research.					3	2	1	N		
3.7	Demonstrate proficiency in DNA techniques fundamental to biomedical research: transformation, gel electrophoresis and polymerase chain reaction.					3	2	1	N		

Standard 4.0 The students will demonstrate proficiency in understanding protein expression and purification.

*One of these columns must be checked

Learning Expectations		Check the appropriate Mastery or Non-Mastery column*				Rating (Circle one)				Mastery	Non-Mastery
4.1	Describe the four different classes of proteins.					3	2	1	N		
4.2	Illustrate how the structure of protein relates to these functions.					3	2	1	N		
4.3	Describe how peptide bonds are formed.					3	2	1	N		
4.4	Compare and contrast different methods of protein purification.					3	2	1	N		
4.5	Describe how beneficial protein products are made by recombinant DNA technology.					3	2	1	N		
4.6	Demonstrate proficiency in protein purification by monitoring protein separation using chromatography.					3	2	1	N		

Standard 5.0 The students will demonstrate proficiency in understanding tissue and cell culture.

*One of these columns must be checked

Learning Expectations		Check the appropriate Mastery or Non-Mastery column*				Rating (Circle one)	Mastery	Non-Mastery
5.1	Describe the composition of blood and various cell types.					3 2 1 N		
5.2	Demonstrate an understanding of how the human immune system works.					3 2 1 N		
5.3	Compare and contrast cells grown in vivo and vitro.					3 2 1 N		
5.4	Demonstrate proficiency in growing cells in tissue culture by growing and counting cells.					3 2 1 N		

Standard 6.0 The students will demonstrate proficiency in understanding the legal environment and technology transfer aspects of biomedical research.

*One of these columns must be checked

Learning Expectations		Check the appropriate Mastery or Non-Mastery column*				Rating (Circle one)	Mastery	Non-Mastery
6.1	Examine and evaluate issues relating to intellectual property rights.					3 2 1 N		
6.2	Demonstrate knowledge of how scientific developments are legally protected and receive FDA approval.					3 2 1 N		
6.3	Research proper methods of documenting scientific research in the laboratory.					3 2 1 N		
6.4	Describe the role of technology transfer and patient lawyers in the biomedical field.					3 2 1 N		

Standard 7.0 The students will demonstrate skills in the laboratory.

*One of these columns must be checked

Learning Expectations		Check the appropriate Mastery or Non-Mastery column*				Rating (Circle one)	Mastery	Non-Mastery
7.1	Read, interpret, verbalize, and apply policies and procedures appropriate to the biomedical research setting.					3 2 1 N		
7.2	Participate in a biomedical research orientation prior to a research setting.					3 2 1 N		
7.3	Utilize proper communication, critical thinking, and problem solving techniques.					3 2 1 N		
7.4	Demonstrate the safe and appropriate use of equipment and supplies.					3 2 1 N		

Additional Comments _____